



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/804,890	03/18/2004	Chen-Chung Li	67,200-1218	8184
7590 12/01/2004			EXAMINER	
TUNG & ASSOCIATES			SOUW, BERNARD E	
Suite 120			ART UNIT	
838 W. Long Lake Road			PAPER NUMBER	
Bloomfield Hills, MI 48302			2881	

DATE MAILED: 12/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/804,890

Applicant(s)

LI ET AL.

Examiner

Bernard E Souw

Art Unit

2881

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9, 11-14, 17 and 18 is/are rejected.
- 7) ☒ Claim(s) 10, 15 and 16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

Although R_{am} is properly defined as being 4 cm on page 8/sect.[0039]/line 4,

- the specification of the offset $|Re - R_{am}|$ on page 14/sect.[0061]/lines 1-4 (= .16 and .09) is objected to, because it does not carry a proper unit.

It is suggested by the examiner to assign to both Re and L a unit of either "cm", i.e., similar to the specification of R_{am} above, or "inch", similar to the specification of the beam spot or the target wafer as recited on pg.2/sect.0005]/lines 4-6.

- the specification of Re (≈ 4.16) on page 14/sect.[0064]/lines 2-4, is objected to, because it does not carry a proper unit.
- the specification of the radius tolerance level L on page 14/sect.[0061]/line 5, sect.[0062]/lines 6-7, sect.[0063]/lines 2-3, ($<.09$; $\approx 4.16 \pm .03$; $.02$, respectively) is objected to because it does not carry a proper unit.

Appropriate correction is required, not only limited to the recited page numbers, sections and lines, but throughout the entire disclosure, including the claims.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 8-11, 17 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 8-11, 17 and 18 recite the wording "*radius tolerance level L*", which is deemed indefinite because its definition, as described in the specification, does not have a correct unit (see above objection to the specification). Since both R_{am} and R_e have a dimension of length, the offset L , defined as the absolute value of $|R_e - R_{am}|$, must have the dimension of length, too.

3. Claim 11 is additionally rejected under 35 U.S.C. 112, second paragraph, since a predetermined value of $L=0.02$ does not mean anything. As an example, $L=0.02$ km, and $L=20,000$ mm are substantially the same, as their respective units differ by 10^6 .

In order to proceed with this examination, the predetermined value of $L=0.02$ is assumed as being totally arbitrary, and can be replaced by any numerical value expressed in any unit, as long as it is a finite number.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 2, 4-7, 12-14, 17 and 18 are rejected under 35 U.S.C. 102(a) and (e) as being anticipated by Adams et al. (USPAT 6,670,624).

► Regarding claims 1, 6, and also claim 17 –insofar as the examiner can ascertain beyond the above rejection regarding indefinite radius tolerance level L under the second paragraph of 35 U.S.C. 112-- Adams et al. disclose an ion implanter 100 shown in Figs.1 and 2 for implanting ions into a target wafer, as recited in Col.3/ll.30-32, the ion implanter 100 comprising an ion source, which is not shown, but inherent in Adam's as a source for the ion beam 15 shown in Fig.1 and Fig.2, as recited in Col.3/ll.30-39; an atomic mass unit (AMU) analyzing magnet having a fixed radius R_{am} , which is unlabeled in Figs.1 and 2 as a part of the spectrometer unit 100 recited in Col.3/ll.55-59; an ion extraction voltage source, which is not shown but is inherent to every ion source; a communication interface adapted to monitor implantation parameters including an extraction voltage V_s of the source of implanting ions and a real-time magnetic flux density B of a magnetic field of the AMU analyzing magnet generated by a beam current flowing through the analyzing magnet, which is inherent to the spectrometer 100; an equipment server having a data log 75, wherein the equipment server 75 is in communication with the ion implanter 100, as recited in Col.3/ll.30-32, and is in further communication with the communication interface for monitoring parameters communicated from the ion implanter to the equipment server data log 75 during

operation of the ion implanter 100, wherein the parameters are the magnetic field B as recited in Col.3/line 56, and the V_s of the source of implanting ions from the ion implanter, which is an inherent parameter of the spectrometer 100, as implicated by accelerating voltage V recited in Col.4/ll.20-21.

- Specifically regarding claim 17, the step of recalibrating the ion implanter 100 is recited in Col.1/ll.43-55.

- ▶ Insofar as the examiner can ascertain beyond the above rejection regarding indefinite wording "medium current" in claim 2, Adam's ion implanter is a medium current ion implanter, since otherwise special remarks would have been recited.

- ▶ Regarding claims 4, 5, 7, 13, 14 and 18, the means or step for calculating an estimated real-time radius R_e and determining an offset with respect to R_{am} is recited in Col.5/ll.16-19.

- ▶ Regarding 7-9, 11 and 18, insofar as the examiner can ascertain beyond the above rejection regarding indefinite radius tolerance level L under the second paragraph of 35 U.S.C. 112, the means or step for subtracting the calculated radius R_e from the pre-measured analyzer magnet radius R_{am} , as well as calculating the offset between R_e and R_{am} and determining its absolute value, are all inherent in Adam's, since, with R_{am} being inherently known as device parameter, R_e also inherent in Adam's from using the equation equivalent to claim 5, recited by Adam et al. in Col.5/ll.16-19, so is the difference between R_{am} and R_e being also inherently known in Adam's.

6. Claims 1, 2, 4-7, 12-14, 17 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Byun et al. (USPAT 6,177,679).

► Regarding claims 1, 6, and also claim 17 --insofar as the examiner can ascertain beyond the above rejection regarding indefinite radius tolerance level L under the second paragraph of 35 U.S.C. 112-- Byun et al. disclose an ion implanter shown in Figs. 2, 5 and 6 for implanting ions into a target wafer 28, comprising an ion source 20, an atomic mass unit (AMU) analyzing magnet 22 having a fixed radius R_{am} , as recited in Col.2/ll.51-67 and Col.3/ll.4-8, and an ion extraction voltage source, which is not shown but is inherent to every ion source.

Further, a communication interface adapted to monitor implantation parameters including an inherent extraction voltage of the source of implanting ions and a real-time magnetic flux density B of a magnetic field of the AMU analyzing magnet generated by a beam current flowing through the analyzing magnet 22, is also inherent in Byun's device, so is also an equipment server having a data log in communication with the ion implanter, and in further communication with the inherent communication interface recited previously for monitoring parameters communicated from the ion implanter to the equipment server data log during operation of the ion implanter, wherein the parameters are the magnetic field B , and the extraction (and acceleration) voltage of the source of implanting ions from the ion implanter, which are all inherent parameters of Byun's spectrometer that are required in order to determine the voltage from the HV power supply 35 to be applied to the interceptor 34 shown in Fig.4, interceptor 57

shown in Fig.5, or interceptor 75 shown in Fig. 6, especially if an acceleration voltage is used as shown in Fig.6.

- Specifically regarding claim 17, the step of recalibrating Byun's ion implanter is inherent in Byun's, as implicated in Col.3/ll.4-67 and Col.4/ll.1-61, since it would be impossible for Byun et al. to implant pure ions if the conditions recited in Col.3/ll.4-67 and Col.4/ll.1-61 are not met.

- ▶ Insofar as the examiner can ascertain beyond the above rejection regarding indefinite wording "medium current" in claim 2, Byun's ion implanter is a medium current ion implanter, since otherwise special remarks would have been recited.

- ▶ Regarding claims 4, 5, 13, 14 and 18, the means or step for calculating an estimated real-time radius R_e is recited by Byun et al. in Col.3/ll.10-19.

- ▶ Regarding 7-9, 11 and 18, insofar as the examiner can ascertain beyond the above rejection regarding indefinite radius tolerance level L under the second paragraph of 35 U.S.C. 112, the means or step for subtracting the calculated radius R_e from the pre-measured analyzer magnet radius R_{am} , as well as calculating the offset between R_e and R_{am} and determining its absolute value, are all inherent in Byun's, since, with R_{am} being inherently known as device parameter, R_e also inherent in Byun's from using equation on pg.10/sect.0047]/lines 4-6, so is the difference between R_{am} and R_e also inherently known in Byun's.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 3, 8, 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adams et al. in view of general knowledge in the art.

Adams et al. show all the limitations of claims 3, 8, 9 and 11, except the recitations of specific limitations to be individually addressed as follows:

► Regarding claim 3, Adam's device is definitely operable for mass ranges less than 50 atomic mass unit (amu), since Adam's disclosure does not recite any restriction on the mass range for which the disclosed device would be capable and/or incapable of, and there is nothing known in the art that would possibly prevent Adam's device from performing any of its intended functions for mass ranges below 50 amu.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to design Adam's device for a specific mass range less than 50 amu, since applicant has not disclosed that 50 amu solves any stated problem or has any particular purpose and it appears that Adam's invention would perform equally well with any value of amu inherent in Adam's disclosure, such that a specified mass range of less than 50 amu is an obvious matter of design choice to Adam et al..

The obvious matter of design choice is also admitted by Applicant by the use of the wording "desired" in line 2 of the present claim 3.

Furthermore, how to design Adam's device for any specified mass range involves only routine skills in the art.

► Regarding claims 8, 9 and 11, the means or step for providing a radius tolerance level L and predetermining L to 0.02 (which is a totally arbitrary number, as recited previously) is an obvious matter of design choice to Adam et al., since applicant has not disclosed that $L=0.02$ solves any stated problem or has any particular purpose and it appears that Adam's invention would perform equally well with any value of L inherent in Adam's disclosure. Therefore, Applicant's predetermination and/or definition of L is a mere matter of design choice that is unpatentable, because it only involves routine skill in the art.

8. Claims 3, 8, 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over by Byun et al. in view of general knowledge in the art.

Byun et al. show all the limitations of claims 3, 8, 9 and 11, except the recitations of specific limitations to be individually addressed as follows:

► Regarding claim 3, Byun's device is definitely operable for mass ranges less than 50 atomic mass unit (amu), since Byun's disclosure does not recite any restriction on the mass range for which the disclosed device would be capable and/or incapable of, and there is nothing known in the art that would possibly prevent Byun's device from performing any of its intended functions for mass ranges below 50 amu.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to design Byun's device for a specific mass range less than 50

amu, since applicant has not disclosed that 50 amu solves any stated problem or has any particular purpose and it appears that Byun's invention would perform equally well with any value of amu inherent in Byun's disclosure, such that a specified mass range of less than 50 amu is an obvious matter of design choice to Byun et al..

The obvious matter of design choice is also admitted by Applicant by the use of the wording "desired" in line 2 of the present claim 3.

Furthermore, how to design Byun's device for any specified mass range involves only routine skills in the art.

► Specifically regarding claims 8, 9 and 11, the means or step for providing a radius tolerance level L and predetermining L to 0.02 (which is a totally arbitrary number, as recited above) is an obvious matter of design choice to Byun et al., since applicant has not disclosed that L=0.02 solves any stated problem or has any particular purpose and it appears that Byun's invention would perform equally well with any value of L inherent in Byun's disclosure. Therefore, Applicant's predetermination and/or definition of L is a mere matter of design choice that is unpatentable, because it only involves routine skill in the art.

Indication of Allowable Subject Matter

9. Claims 10, 15 and 16 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Reasons for Indication of Allowable Subject Matter

10. The following is a statement of reasons for the indication of allowable subject matter:

- ▶ Claim 10 would be allowable for limiting the amu-variation of the desired ions to less than 0.5 amu, which is neither anticipated nor rendered obvious by any prior art.
- ▶ Claim 15 and 16 would be allowable for reciting steps that may effectively prevent undesirable ions from being implanted into the target wafer, i.e., the step of "signaling an alarm" in claim 15, and the step of "stopping the operation of the ion implanter" in claim 16.

Communications

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard E Souw whose telephone number is 571 272 2482. The examiner can normally be reached on Monday thru Friday, 9:00 am to 5:00 pm..

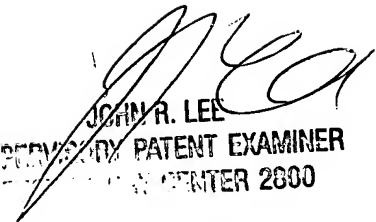
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R Lee can be reached on 571 272 2477. The central fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306 for regular communications as well as for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0956.

Application/Control Number: 10/804,890
Art Unit: 2881

Page 12

bes
November 15, 2004


JOHN R. LEE
SUPERVISOR, PATENT EXAMINER
FEDERAL BUREAU OF INVESTIGATION
WASHINGTON, D.C. 20535
FBI CENTER 2800